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Why Does Constructed Action Seem Obligatory? An Analysis of “Classifiers” and the Lack of Articulator-Referent Correspondence

MANY PEOPLE WOULD AGREE that watching a skilled signer of American Sign Language (ASL) or any sign language narrate a story is a visual treat. The signer’s hands and arms are busy articulating lexical items that are governed by the phonology of the language, and those items are sequenced in ways that adhere to the grammatical conventions of that language. Nonmanual signals such as the linguistic use of eyegaze, head tilt, and various mouth movements are also part of the vivid visual displays of body language the signer creates. Additionally, parts of the body, particularly from the waist upward, are also very involved in depicting various aspects of characters or animate entities from the narrative.

During descriptions of animate entities, the signer often provides a correspondence between parts of her own body and that which she is attempting to describe—the referent object. Correspondence between the signer and the referent is common in signed languages, and such correspondence can be seen in various communicative devices: fixed

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or “frozen” signs (i.e., those that do not tend to vary with the articulation of phonological parameters), more productive signs such as so-called classifiers, and uses of the upper body to depict characteristics and movements of an animate being. This article discusses various aspects of this correspondence, and data from ASL are used to illustrate points about this commonly used phenomenon in signed languages.

Correspondence between the Signer’s Body and the Referent

Some signs depict correspondences between the signer’s hands and arms and the referent—a characteristic of sign languages that has been called *iconicity*. Chuck Baird, a well-known Deaf artist in the United States, knows well that some signs are iconic, and one facet of iconicity is that the hands and arms can exist in a one-to-one relationship with the referent. Baird’s work contains many examples of articulators creating shapes that mirror those of real-world objects and phenomena—examples of ASL signs. For instance, his 1978 work *Sunset in Austin* captures the image of a sun setting over the horizon by showing the sun with the ASL F handshape and the horizon with the horizontally oriented nondominant arm (figure 2 in the appendix).¹ Further, his 1992 work, *Fingershell*, depicts a turtle beside two hands that are articulating the ASL sign TURTLE (see figure 3 in the appendix); presumably the thumb of the right hand, which points outward from an A handshape (with the dorsal side of the pinky facing downward), portrays the turtle’s head, while the cupped left hand over the right hand (with the exception of the tip of the thumb) corresponds to the turtle’s shell. Both signs are iconic, although *Austin Sunset* depicts an inanimate entity, whereas *Fingershell* represents an animate one.

Sign language researchers also know that many signs are iconic and that iconicity is multifaceted (e.g., see Taub 2001). Even in the early days of research on ASL, various authors (e.g., Mandel 1977; DeMatteo 1977; and Klima and Bellugi 1979) wrote about the pictorial quality of some signs and the various actions that a signer utilizes to create meaning. However, it is also commonly known that not all signs of sign languages are iconic—many have little to no physical correspondence with their referents—like the current-day ASL sign SCHOOL, which is articulated

by clapping the dominant hand on the nondominant hand twice. This sign bears little visual resemblance to a school or symbol that is used to refer to schools, such as those that appear on street signs in the vicinity of school buildings (e.g., students walking and carrying books, a mortarboard and tassel, or the symbolic one-room schoolhouse). Signs such as SCHOOL might be considered arbitrary—at least from a visual perspective—although, like many signs, it is likely that a folk etymology that is iconically based could be suggested (e.g., the sign might stem from the clapping that a teacher does to get the students' attention).

Taub (2001) has described a one-to-one relationship between articulator and referent as “shape-for-shape iconicity.” By this, Taub suggests that the creation of meaning is about “the shapes of the articulators themselves and using them to encode images of similar shapes” (68). She provides the following examples of shape-for-shape iconicity in ASL: TREE (“The nondominant hand and forearm represent the ground, the dominant forearm represents a tree trunk, and the spread dominant hand represents the branches.”) and BOOK (“Two flat B-hands touching at the pinky edge repeatedly come together at the palms and open again; here the flat handshapes encode the cover and pages of a book, whereas the wrists, forearms, and so on ‘don’t count’ in the mapping.”) (69).

In addition to a signer taking advantage of iconicity as it is present in common signs of a signed language, she often manipulates so-called classifiers—those signs that depict various aspects of an object—to provide a correspondence between parts of the signer's body and the source object during a narrative. Many classifiers (or what I refer to henceforth as *polycomponential signs*) also seem to be iconically motivated in various ways;² the shapes that are created by the hands and arms seem to reflect characteristics of the objects that they reference or describe (e.g., see Cogill-Koez 2000 for an analysis of classifier predicates as devices that are highly influenced by visual representation). It is clear, however, that polycomponential signs do much more than simply depict the physical characteristics of an entity. For instance, Schembri (2003) suggests that polycomponential signs (or polycomponential verbs, as he refers to them) tend to be “characterized by the highly productive combination of a range of meaningful units denoting figure, ground, motion, location, orientation, direction, manner, aspect, extent, shape, and distribution” (6).

In addition to shape correspondences between the articulator and the referent, size considerations also influence sign production. In most cases, the size of the articulation represents the relative size of the referent (Supalla 1982; Taub 2001). For example, if a signer produces two polycomponential signs, they must be relative in size both to the two referents and to each other. For example, the retelling of a scene involving a cylindrical object on the ground that is being approached by a vehicle would likely elicit two polycomponential signs—one for each object. The polycomponential sign for the cylindrical object would most likely be interpreted as some object with a diameter of at least several centimeters (e.g., a wooden pole); it would probably not refer to something the size of a toothpick or even a pencil.

Finally, just as signs of various types (including polycomponential signs) can depict one-to-one correspondences between articulator and referent, a signer's body or parts of the body (most commonly the body from the waist upward) can depict one-to-one relationships with similar parts on the referent.³ The referent could be human or animal or something else that resembles a human or an animal. Taub (2001, 72–73) notes that such correspondences occur because the bodies of humans and many other animals are similar: “Many other animals have the same general body type as humans: four limbs, a torso, a head with eyes, nose, ears, and a mouth. Because of this, it is natural for us to see correspondences between certain animal body parts and certain human body parts, the ones that have analogous structural relationships to the whole body.”

Supalla (1982, 1990, 2003) states that we can describe these one-to-one correspondences morphemically, and Lillo–Martin (1995) has analyzed such articulations in syntactic terms—as predicates that reflect agreement with their subjects. Other authors have used the term *constructed action* to refer to a signer's use of various parts of her body (e.g., head, torso, eyegaze) to depict the postures or actions of a character (Metzger 1995; Liddell and Metzger 1998; Aarons and Morgan 2003, among others). For at least some of the authors who have adopted this term, the basic claim is that constructed action contains gestural elements that can combine with linguistic elements.

In short, within a narrative and even within nonnarrative discourse, signers use their body in various ways to depict correspondences be-

tween the body and a referent. The correspondence is sometimes evident in lexicalized signs even though certain signs become more arbitrary over time (Klima and Bellugi 1979). However, the correspondence is perhaps more evident in the use of some polycomponential signs and certainly in the use of constructed action.

Another point about narrative discourse in ASL (and seemingly other sign languages as well) is that the various ways of depicting an animate entity seem to interact—perhaps in structured ways. Since a signer can use various strategies to refer to and describe an animate referent (e.g., signs, grammar, polycomponential signs, upper-body movements that mirror the referent's movements), one may wonder when and why one strategy is preferred over another. One may also wonder why upper-body movements that mirror a referent's movements are even necessary. That is, would it not be possible for a signer to employ only common signs or even polycomponential signs in descriptions—especially since the latter come from a system that is at least partially productive and can presumably be used to describe any concrete referent?

It seems that, despite all of the ways in which polycomponential signs function in a signed language, they often provide only limited information about the referent. Rather than utilize only signs and polycomponential signs (and the grammar that governs their combination), signers frequently prefer to also employ other iconically motivated strategies at their disposal. These often involve the use of the upper body to create correspondences between the body and the parts of the referent. Such correspondence could in fact facilitate the imparting of specific and somewhat detailed information about that object, such as facial affect or expression, torso position and movement, and hand and arm movement. At times the upper body can provide information about an object that cannot be communicated simultaneously with the use of polycomponential signs because of limitations resulting from the conventionalization of some polycomponential signs, the number and/or shape of the signer's articulators, and motor constraints that affect articulation. In those cases, upper-body movements and configurations of various upper-body parts may provide important details about eyegaze, mouth configuration, and more.

In other words, the use of the upper body to portray characteristics

of a referent object seems to be a necessary strategy that can also complement the use of polycomponential signs and other devices. In many cases, polycomponential signs are not sufficient for communicating specific characteristics of a referent (e.g., facial affect or expression, torso position and movement, and hand and arm movement). In defense of polycomponential signs, the use of the upper body alone is often not sufficient for communicating information about referent objects, such as location, path movement, figure, ground, direction, certain aspects of orientation, , and distribution. In short, polycomponential signs and upper-body movements work together in various ways. It is likely that one could not exist without the other in signed languages.

This article describes factors that appear to influence a signer's choice of polycomponential signs and/or upper-body movements when given the task of describing animate entities. The arguments herein are based on both production and judgment data of ASL. Language segments from five signers compose the data for this article, but a more complete and general description of the study can be found in Quinto-Pozos (2007), which describes data from ten signers. The data here allow us to investigate in detail specific aspects of the signed segments that indicate when a signer feels that upper-body movements that match the referent's are a necessary part of a description in ASL.

The claims in this article are built on the following argument: When signers are communicating information about animate entities, they most often employ constructed action—from subtle uses of one or a few articulators (e.g., a head turn and eyegaze that mimic those of the referent) to more elaborate uses of many articulators (e.g., the torso position, arm and head movement, facial expression, and eyegaze of the referent) as a necessary part of the communication. Constructed action sometimes co-occurs with polycomponential and other signs and sometimes alternates with them in sequence. The infrastructure of sign language that allows for the complex and frequent use of constructed action when describing animate entities rests strongly on the potential of the signed modality to represent things in a visually iconic fashion and the ability to utilize various articulators at once—perhaps what most distinguishes the signed from the spoken modality. It is perhaps this last point—the fact that a signer can normally control various articulators at

once that can provide complementary information—that may be the most crucial in understanding the reason that constructed action is a necessary part of a signed language. It provides, in a simultaneous fashion, information that cannot be provided efficiently or robustly by using only signs or polycomponential signs.

Suggested Constraints on the Use of Entity Polycomponential Signs

As the Baird examples suggest, the hands and arms frequently describe referents in ways that may be considered iconic. Some of these iconic forms depict one-to-one relationships between the articulator and the referent (or part of the referent), thus creating a degree of correspondence between referent and articulators. This is true of various types of signs in ASL, including polycomponential sign forms. However, when communicating information about certain aspects of animate entities, the hands and arms alone—in the form of polycomponential signs—frequently do not provide sufficient detail about the referent. This may be because of articulatory limitations that are a result of the way in which human hands and arms and their movements correspond with the real-world objects they are describing.

Polycomponential signs (and other signs as well) may not allow for adequate correspondence between the articulators and the referent, as the data in this article demonstrate. Consequently, I argue that signers feel that it is necessary to use constructed action to facilitate the communication of optimal information about the referent. As mentioned briefly earlier, the lack of correspondence between polycomponential signs and their referents may stem from the following: (1) the conventionalization of some polycomponential sign forms does not allow those forms to be maximally descriptive, (2) the number and shape of the articulators in spontaneously produced polycomponential sign forms may not correspond with equivalent parts of the referent, and (3) motoric constraints during polycomponential sign production may not allow for correspondence between referents and items with which they interact. These factors may cause the signer to utilize constructed action in order to complement the polycomponential sign forms and create a more adequate correspondence between

the signer's articulators (including hands, arms, and entire upper body) and the referent.

Conventionalization of Entity Polycomponential Signs

In their repertoire of linguistic devices, signers of ASL possess the ability to produce various polycomponential signs that function mostly as pronouns and verbs. For this discussion, the focus is on *entity* polycomponential signs, which represent an entire semantic class of objects and have been labeled elsewhere as “semantic classifiers” (Supalla 1982, 1986) and “class constructions” (Schick 1990), among other terms. The handshapes of entity polycomponential signs tend to be conventionalized and normally exist within the handshape inventory of the language. The phonological movement and location parameters of these signs have also been described in linguistic terms (e.g., Supalla 1982, 1986), although recent work suggests that these parameters have characteristics of nonlinguistic gesture (Schembri 2003; Schembri, Jones, and Burnham 2005).

Polycomponential signs are often iconic at some level, but they can also fail to capture salient details of the referent by not allowing for adequate correspondence between the articulators and the referent. Of course, not every detail needs to be included in a signer's reference (and certain restrictions such as memory and constraints of efficient communication likely guide a language user), but salient facts may exist that nevertheless are not included. For instance, in the case of animate entities it may be important to depict characteristics that correspond with human or animal movements (of all types—body, torso, head, facial expressions, etc.) since such movements provide meaningful, and often subtle, information.

One example is the polycomponential sign frequently used to refer to an upright person (PS1: [1 handshape]⁴), which represents the relative location of a person in relation to other objects or the general path that a person takes through space; however, a significant amount of the information about that person is unavailable in the manual part of the sign. The person's eyegaze, facial expression, limb movements, and other specific—and sometimes subtle—movements of upper-body parts generally cannot be represented by the 1 handshape polycomponential sign. If a signer's goal is to include any information of

this nature, the 1 handshape polycomponential sign is not sufficient. At times, however, a signer may not wish to provide such information when using the PSI: [1 handshape], such as when describing the general path that a person takes through space or a person's location in relation to other objects or entities that the signer establishes in the signing space. Thus, the PSI: [1 handshape] is adequate in some instances and insufficient in others; the latter cases are a result of the lack of correspondence between the articulators and the referent.

Taub (2001) suggests that entity polycomponential signs (or “semantic classifiers,” as she refers to them and as they were discussed in Supalla 1986) are *highly schematized*, which roughly means that there is a match (such as a shared general shape) between the referent image and the linguistic form, but that match is somewhat inexact as compared to other polycomponential signs. Taub would likely refer to the PSI: [1 handshape] just described as a highly schematized form since a match exists between the vertically extended index finger and an upright person, but it does not, for the most part, represent specific movements of the upper body. Highly schematized forms do not contain detailed information about the referent and would probably not allow for adequate correspondence between the articulators and the referent when the signer's goal is to include such information for the interlocutor.

Number and Shape of Articulators in Polycomponential Signs

Other limitations of the hands and arms that result in less than optimal correspondence between the articulators and the referent are those that come about when the number and shape of the articulators (on the hands and arms) do not equal the number and/or shape of parts of the object to which they refer. For instance, since a signer has only two arms and hands, information about a four-legged lizard could result in inadequate correspondence between articulators and the animal if the signer wishes to show the action of more than one leg at the same time while also providing information about the lizard's head and face. Taub (*ibid.*, 85) notes that “the number of articulators represents the number of referents.” Thus, the communication of a specific number of referents could prove challenging if there are not enough articulators for a one-to-one correspondence between each articulator and each referent.

With regard to shape, a polycomponential sign might not match the shape of the object to which it refers but may be the best choice among several. For instance, a relatively leafless plant that normally has a straight stem but has grown in a twisted and crooked manner may be represented by a PSI: [1 handshape] even though information about the crooked aspects of that plant will have to be given separately; the signer's finger simply cannot twist and bend to correspond with the shape of the plant stem.

Motoric Constraints

Limitations on polycomponential signs that are based on articulatory factors may also exist. Such factors are potentially conflicting movements of two or more articulators or impossible/difficult movements of single articulators. An example of a motoric constraint based on the use of two or more moving articulators would be a signer's representation of an animate entity that is interacting with an object whose movement is asymmetrical with that of the animate entity. In this case, the signer would perhaps experience motoric difficulties if using two polycomponential signs simultaneously. Battison (1978) suggested that such movement would not be allowed for signs in ASL because of the symmetry constraint, and the same may also hold for polycomponential signs. In some cases, motoric constraints may lead to phonological constraints—the very type that Battison wrote about early in the literature of ASL phonology.

An example of impossible or difficult movements of single articulators would be a signer's attempt to use a PSI: [1 handshape] to show a person's backward head tilt (without a concomitant backward torso tilt). The two most distal joints of the index finger do not normally allow the finger to bend backward (toward the back of the hand), but they do allow the index finger to bend forward. Thus, one could represent a person bending over to get a drink of water with the 1 handshape by bending the finger (i.e., moving the tip forward and downward by allowing the two most distal joints to hinge), but the same would not be true for a backward head tilt. To represent that action with a polycomponential sign, a signer would likely have to switch to a PSI: [S handshape] (representing the head of a person) or a PSI: [V handshape] (representing the direction of the person's eyegaze) and hinge the hand

backward at the wrist joint. Thus, the PSI: [1 handshape] for representing a backward head tilt could not be used alone because of motoric constraints.

These three factors lead to inadequate correspondence that can limit the amount and quality of the information that is communicated about an object. With regard to animate entities, the inclusion of such information would possibly signal the difference between a clear depiction of an object that includes details necessary for understanding important facets of that object and a depiction that is unclear and lacking in information. A signer may also feel that certain types of important information about an object cannot be correctly communicated using signs or polycomponential signs alone. In that case, the factors that lead to inadequate correspondence would encourage a signer to employ other strategies more apt to convey the relevant information.

In other instances, polycomponential signs may be ambiguous in nature and thus also limit the quality of the related information—especially in the case of iconic elements that depict one-to-one correspondences between the articulators and the referent. These issues are considered in the following sections, in which various production data are described. My goal is to demonstrate that various factors that lead to inadequate correspondence come into play when a signer does not use constructed action to relate important information.

Methodology

What follows is a condensed version of the data collection procedures for this study. A full account can be found in Quinto-Pozos (2007).

Participants, Part A

Ten participants were videotaped for Part A of the study. Five of the ten are referred to as Deaf of Deaf (DD), having acquired ASL from interaction with their Deaf caregivers. The other five participants were born to hearing parents who did not use ASL; between the ages of two and seven years each of them acquired ASL from interaction with friends, siblings, or other adults. This latter group is referred to as Deaf of Hearing (DH). The following data include the language production of five of the ten participants (DH1, DH2, DD2, DH4, and DH5).

Procedure, Part A

Each of the ten participants performed the same task for this study. Specifically, each was videotaped while producing ASL renditions of twenty short movie clips (hereafter *elicitation clips*) that depicted various animate and inanimate entities—all of which were included in an effort to elicit the use of constructed action and polycomponential signs. In this article, only four of the elicitation clips are described. These elicitation clips lasted less than twenty-four seconds (the four were respectively 12, 23, 24, and 8 seconds in duration, according to how they appear later in this article), and two of the four presented here each showed a person performing an action, while two showed an animal moving in some way.

Throughout the elicitation portion of the data collection, the investigator was seated beside the Deaf participant. This setup served at least three functions: (1) It allowed for a person to serve as an interlocutor for the language production, (2) it facilitated the videotaping of the language production of both the participant and the investigator, and more important for the design of this study, (3) it allowed the investigator to interact with the participant in order to request modifications to the participant's sign production. The Deaf participant and the investigator were, in each case, the only two people present in the room in which the data collection took place. Each participant provided two versions of each elicited clip, the details of which follow.

First, each participant was shown an elicitation clip twice (in an effort to aid in comprehension and recall of the material), and then the participant produced an ASL rendition of what was seen (hereafter referred to as a *first-production clip*). In a prerecorded general description of the study tasks produced by a Deaf user of ASL, all of the participants were instructed to sign ASL (as opposed to using signing that is influenced by English) during their descriptions of the elicitation clips.

After signing the first-production clip for each elicitation clip, each participant was shown the elicitation clip again and then asked to once more explain what was seen in the elicitation clip (this production is hereafter referred to as the *second-production clip*) but with at least one change from the first rendition. Essentially, the investigator asked the participant to exclude one of the communicative devices that had been

used for that elicitation clip during the first-production clip. For the elicitation clips that contained people or animals, if the participant produced a mouth movement or body action that mirrored the same of a character in the elicitation clip, then the investigator would recreate, as closely as possible, the original production of that communicative device (and what immediately led up to it) and then ask the participant to exclude that device for the second-production clip.

The participant was usually asked to exclude only one communicative device for the second-production clip. For example, for an elicitation clip that showed a seal bobbing its head up and down and opening its mouth (as if making a sound), the participants frequently mirrored the opening and closing mouth with their own mouth performing the same movement. In these cases, the investigator asked the participant to exclude that communicative device for the second-production clip. This process allowed the investigator to explore alternative strategies that signers employ for communicating information about animate entities. Asking signers to do something differently a second time after doing it naturally the first time allows one to investigate when a choice may be the only option versus when it is the best alternative among several. The entire data collection for Part A of the study required approximately one hour per participant.

Participants, Part B

There were eighteen participants for Part B of this study, the goal of which was to obtain judgments of first- and second-production clips from Deaf individuals who did not participate in Part A. The participants included Deaf individuals who use ASL on a daily basis—either with their Deaf and hearing family members or with their coworkers. Most of the participants in Part B work at a school for Deaf children that encourages the use of sign language. Characteristics of the participants for Part B can be found in Quinto-Pozos (2007).

Procedure, Part B

There were 66 production clips (33 first-production and 33 second-production) in Part B. For several reasons, only certain clips were chosen for this portion of the study. First, some of the participants in Part A did not produce a second-production clip. In those cases, the first-

production clip was automatically excluded from the judgment clips. Additionally, in an attempt to maximize the number of participants who could be involved in Part B, each judgment session was planned to include only the number of production clips that could be viewed and assessed in approximately one hour. Thus, a limited number of first- and second-production clips were chosen for these sessions. First- and second-production clips that contained clear differences in the production of communicative devices were selected. In most cases, the participant provided an example of constructed action for the first clip but did not do the same for the second. No production clips were used that focused only on the use of polycomponential sign for both clips.

The participants' task for Part B was as follows: First, they would view an elicitation clip that corresponded with the four subsequent production clips to be viewed. The first- and second-production clips were randomized throughout the viewing and adjusted so that a particular signer was not viewed twice in a row and the second-production clip for any particular signer might be viewed first or second by the participants.

After viewing each production clip, the participant would rate the signer's depiction on a scale of 1 to 5 on two parameters: degree of clarity and degree of correctness (where 1 meant least clear or correct, and 5 meant most clear or correct). These two parameters were selected in an effort to operationalize the concept of obligatoriness, which drove the design of the study (see Quinto-Pozos, 2007). Essentially, the question that fueled this research design was the following: Can constructed action be considered obligatory? Moreover, part of the method employed to answer the question was based on the judgments of Deaf signers. Whether or not something feels correct to a viewer is one way to approach the question of obligatoriness. This parameter is akin to questions about grammaticality that are commonly used in linguistic data elicitation. However, the question of correctness does not necessarily imply that what the judges are evaluating is part of the grammar. Other systematic processes exist for creating meaning that are not governed by the grammar (e.g., *emblems*, as described by McNeill 1992, among others). It does, however, suggest that there may be both appropriate and inappropriate ways to depict a referent with one's own body.

One example of correctness was provided to the participants in order to help them understand the concept. The ASL sign BROTHER has at least two variants: Both begin at the forehead and terminate on the nondominant hand. However, the handshapes, along with palm orientations, differ between the two. I used these variants in two different sentences and explained that both sentences were different but correct. Then, a third sentence was signed that contained a malformed sign for the same concept—one that uses an incorrect handshape (but the same places of articulation). The third sentence was suggested to be incorrect, although the degree of incorrectness was not given. When these instructions were provided, the judges generally responded with comments and nonverbal affirmations (e.g., head nods, facial expressions) that suggested comprehension. The parameter of clarity was more straightforward; the judges were asked to rate each rendition for the clarity with which the signer depicted the action of the moving object, person, or animal they were shown.

All interaction with the subjects was carried out in ASL. For both of the rating parameters, the participants were asked to focus on the signer's portrayal of the action of the person, animal, or object in the elicitation clip, and they were also advised to not assign clip ratings based on the existence or lack of descriptive details about the person, animal, or object, as well as the surroundings.

Data Presentation and Discussion

In the majority of cases, the language-production participants (Part A) produced some type of constructed action in their first-production clip. After the investigator asked them to avoid producing a specific instance of constructed action for the second clip, the participants most frequently replaced the constructed action with strategies that employ polycomponential signs to portray the same aspect of the elicitation clip. Each production clip (first or second) was then shown to the judges in random order (mixed in with clips from other production participants), and they rated each one for clarity and correctness. In all of the cases presented here, the raters judged the first- and second-production clips to be significantly different (t test, mostly at the $p < .01$ level; see the tables for the significance level of the parameters for each

clip) along both parameters, and the first-production clips received higher ratings. Thus, the clips with the constructed action generally elicited higher ratings than those without constructed action. The data presented in this section demonstrate the specific choices the signers made and how those choices may have influenced the ratings.

For the current discussion, data from four elicitation clips are presented. Each of the four is labeled with a brief descriptive phrase and a letter that corresponds with the data presentation in Quinto-Pozos (2007): woman at water fountain (elicitation clip B), lizard walking away (elicitation clip E), snake uncoiling (elicitation clip F), and woman performing a cartwheel (elicitation clip G). Detailed data from two signers (or two production-clip pairs) are shown for each elicitation clip. These four clips were chosen for this data presentation because they represent, in addition to the data reported in Quinto-Pozos (*ibid.*), most of the pairs that were judged to be significantly different (between first- and second-production clips) in both clarity and correctness. Various other pairs were significantly different from one another in only one of the two parameters.

The following parts of the elicitation material and the collected production data are presented for each clip: (1) a description of the elicitation clip and (2) a partial list of the meaningful aspects of the elicitation clip. A list of the meaningful aspects of each elicitation clip was compiled by carefully examining the clip and documenting what appeared to be the most salient images and movements portrayed in each one. This process of identifying meaningful aspects may be similar to the procedure that Taub (2001, 46–47) describes: A signer selects “significant parts of the image” and is engaged in a “weeding out process” in order to extract important details of any image in order to encode them in the user’s language. However, the production data show that the signers did not produce forms for each listed aspect of the clip. Taub notes that categorization (*i.e.*, schematization) depends on what a language can handle or accommodate, so a signer may occasionally feel that, for linguistic purposes, a potentially meaningful aspect should not be included. The production data include descriptions, in table format, of instances in which the signer produced a form that matched at least one of the significant aspects of the clip. Immediately following a qualitative (*i.e.*, prose) description of the

data, a short section provides quantitative figures in table format of all of the data reported in this article.

Data Presentation: Qualitative

Of the data from eight pairs of production clips, the two that are associated with the elicitation clip of the woman at the water fountain contain the most examples of the limitations of polycomponential signs. These two pairs provide examples of each type of limitation discussed earlier.

Elicitation Clip B: Woman at Water Fountain

DESCRIPTION. A woman who is in the hallway of an office building steps up to a water fountain that is mounted on the wall, leans forward with her entire torso and head to take a drink, and with her right hand pushes the bar to release the water. The water release bar is not visible from the camera's perspective, but it is clear that the woman's hand has performed an action to release the water. After taking a drink, the woman wipes her mouth area three times with her right hand and then straightens up and walks down the hallway.

The following is a partial list of meaningful aspects of this clip:

- a. There is a physical context for action/movement.
- b. A woman reaches for the water release bar and gazes down at the fountain.
- c. The woman takes a (final) step toward the fountain.
- d. The woman leans over to drink.
- e. The water begins to flow as the woman is leaning over.
- f. The woman takes a long drink (four seconds).
- g. The woman raises her head slightly.
- h. The woman disengages water release bar.
- i. The woman wipes mouth area three times.
- j. The woman stands upright.
- k. The woman turns to the right and walks away.

TABLE 1. Elicitation Clip B: Woman at Water Fountain

	DH1 1st ⁵ clarity $x = 3.68^{**}$ SD = 0.82; correctness $x = 3.52^{**}$ SD = 0.84 viewed: 1st	DH1 2nd clarity $x = 2.89^{**}$ SD = 1.24 correctness $x = 2.26^{**}$ SD = 1.04	DH5 1st clarity $x = 4.36^{**}$ SD = 0.59 correctness $x = 4.05^{**}$ SD = 1.17 viewed: 2nd	DH5 2nd clarity $x = 3.73^{**}$ SD = 1.04 correctness $x = 3.42^{**}$ SD = 1.38
a. context	PS3: [B hs] ("hallway") OFFICE	OFFICE WOMAN		
b. at fountain and gazing downward			PS2: [A-dot] ⁶ (preparing to press bar) CA: gaze down PS3: [L hs, lh] (corner of fountain)	
c. final step				
d. lean to drink	PS1: [A hs, forward hinge at wrist] (head) CA: head lean; PS2: [A hs] (turning knob)	PS1: [X hs, forward hinge at wrist] (torso lean)	PS1: [A hs, forward hinge at wrist] (head) CA: head/ torso lean CA: pursed lips	PS1: [A hs, foward hinged at wrist] (head) CA: head tilt
e. water flows	CA: pursed lips		PS1: 4hs (flowing water)	PS1: [1 hs, lh, horizontal, palm inward] (flowing water)
f. long drink	~ 2 seconds hold of turning knob PS2 and pursed lips CA	PS1: [O hs] partially opens and closes, [11 repetitions], (sucking in water)	~ 2 seconds hold of depressed button and pursed lips CA	PS1: [O hs] partially opens and closes, [12 repetitions], (sucking in water)
g. head raise	PS1: [A hs, palm downward to outward] (head) CA: head tilt upward	PS1: [1 hs, palm downward to outward] (bringing body out of leaning stance)		PS1: [A hs, palm downward to outward] (head)
h. release bar	release PS2: [A hs]		Release PS2: [A-bar hs, lh]	Release PS2 [X hs, thumb extended, lh]

TABLE 1. (Continued).

	DH1 1st ^s clarity $x = 3.68^{**}$ SD = 0.82; correctness $x = 3.52^{**}$ SD = 0.84 viewed: 1st	DH1 2nd clarity $x = 2.89^{**}$ SD = 1.24 correctness $x = 2.26^{**}$ SD = 1.04	DH5 1st clarity $x = 4.36^{**}$ SD = 0.59 correctness $x = 4.05^{**}$ SD = 1.17 viewed: 2nd	DH5 2nd clarity $x = 3.73^{**}$ SD = 1.04 correctness $x = 3.42^{**}$ SD = 1.38
i. mouth wipe			CA: mouth wipe with left hand	PS3: [O hs, rh] (mouth) PS2: [B hs, lh] (wiping motion) CA: mouth wipe
j. stand upright	CA: straighten torso	PS1: [1 hs, palm downward to outward]	CA: straighten torso PS1: [A hs, palm downward to outward] (head) STAND-UP	STAND-UP CA: slight raising of head
k. walk away	PS1: [alternating 1 hs to X hs, move to right] (walk away casually)	PS1: [alternating 1 hs to X hs, move to right] (walk away casually)	PS1: [alternating 1 hs to X hs, move to right] (walk away casually)	PS1: [alternating 1 hs to X hs, move to right] (walk away casually)

Transcription conventions:

PS₁ = entity polycomponential sign following the verb typology for Auslan given in Schembri (2001)

PS₂ = handle polycomponential sign following the verb typology for Auslan given in *ibid.*

PS₃ = size and shape specifier polycomponential sign following the verb typology for Auslan given in *ibid.*

CA = constructed action

hs = handshape

rh = right hand

lh = left hand

2h = both hands

Fingerspelled words are represented by capital letters separated by dashes (e.g., L-I-Z-A-R-D).

Words in small capital letters are English glosses of ASL signs.

Loose translations and other salient information are shown within parentheses.

Phonetic information (e.g., handshape, handedness, hand orientation) is given within brackets.

The data presentation for the woman at the water fountain clip contains one example of the conventionalization of polycomponential signs, two examples of the shape of the polycomponential sign not matching the referent's shape optimally or the signer's not having enough articulators to represent important aspects of the referent, and one example of a motoric constraint on the use of polycomponential signs. The examples are presented in that order.

First, one of the polycomponential signs that has been conventionalized in ASL to depict a sucking action does not provide information about how the mouth is configured during the action; it also provides limited information about the person's or animal's posture. In section f of table 1, both signers utilized similar strategies in their first-production clips for communicating the action of a woman taking a long drink of water at a fountain. That is, both signers used one hand to show that they were holding the water release knob (for approximately two seconds each) while leaning their head forward and pursing their lips to show the action of drinking. However, when asked to remove the pursed lips, both signers used different (albeit similar) renditions of a polycomponential sign (with an opening and closing sequence of the fingers) that depicted the woman's action.

Both signers chose to use the PS1: [O hs], extending (opening) and retracting (closing) of the fingers to depict the action. Unfortunately, this movement does not provide information about the configuration of the woman's mouth (whether the lips are pursed, the jaw is hinged open, etc.) while drinking, which is a partial result of the lack of articulators to create a one-to-one correspondence. This limitation results in an insufficient correspondence between the articulators and the referent. Further, inadequate information results from the use of the polycomponential sign instead of the leaning head and pursed lips (i.e., constructed action) of each signer's first-production clip, which conveyed information about the position of the woman's torso. The PS1: O handshape polycomponential sign with the movement sequence does not communicate details about the woman's posture, which likely results in inadequate articulator-referent correspondence.

Second, an example of the failure of the polycomponential sign to match the referent shows how the lack of shape-for-shape correspondence plays a role in the use of constructed action. This has the potential of introducing ambiguity, as we can see in DH5's rendition

of the “mouth wipe” in section i of table 1. Specifically, with his right (dominant) hand he articulates an O handshape to portray the woman’s mouth (the index finger and thumb represent the upper and lower lips). With his left hand he moves the palm side of his fingers against the O handshape of his right hand—wiping the surface that has been created by the index finger and thumb. While the use of these two polycomponential signs seems to be plausible for showing how the woman wiped her mouth, the O handshape is probably not one of the common choices for depicting a mouth.

In ASL, polycomponential signs that are most often used to represent a mouth generally refer to the actions of talking, barking, screaming, and so on (actions that would show a mouth open and closing based on jaw movement) and in that case would likely consist of a bent B handshape or bringing the pad of the thumb into contact with (or very close to) the pads of the index and/or middle fingers. Thus, DH5 most likely chose an O handshape for a polycomponential sign because the woman was not engaged in talking, barking, or screaming. Rather, she was simply cleaning her motionless mouth with her hand. While DH5 may have produced an acceptable polycomponential sign to represent a mouth being wiped by one’s hand, the shape of the polycomponential sign did not provide optimal correspondence with the referent’s mouth. However, constructed action allows for a richer correspondence, as is suggested by the higher scores on clarity and correctness that were given to DH5’s first-production clip.

Another example of the second factor that influences articulator-referent correspondence in the woman at the water fountain elicitation clip has to do with the number of articulators that would be needed to represent the optimal amount of information in a simultaneous fashion. In his second-production clip (shown in sections e & f of table 1), DH5 is using one articulator to represent the sucking/drinking action and another to represent the flowing water (with a PSI: [1 handshape] that is oriented horizontally). He does not have a third articulator to show the engagement of the water release knob in order to activate the flow of water.⁷ In his first-production clip he used one hand to show the water knob being turned because constructed action captured the lowering of the woman’s torso and her drinking from the fountain.

The scenario differs minimally for DH1, who did have a free articulator in her second-production clip, which was her nondominant (left) hand. However, if she had used that free hand to denote the turning of the water release knob, it would have placed the water release mechanism on the incorrect side of the water fountain in the re-counting of the elicitation clip. She may not have used her left hand for that reason. So, in the case of DH1, it was not the number of articulators per se but rather the way in which those articulators were used that may have resulted in a less-than-optimal articulator-referent correspondence. The result was the same in the case of both signers and their second-production clips. Essentially they did not show the woman's activation of the water, which was done with her right hand and arm. That information, however, was given in both signers' first-production clip with richer examples of constructed action.

In section e of table 1, the data from DH5 demonstrate one of the motoric constraints of polycomponential signs. In his first-production clip, DH5 showed water flowing from the fountain by using constructed action (a head lean and pursed lips) to enact the drinking of water while using his right hand to show the water flowing into his mouth (PS1: [4 handshape]).⁸ For his second-production clip, DH5 was asked to remove the pursed lips when showing the action of drinking, and he produced the segment shown in section f of table 1. Specifically, he used the PS1: [O handshape] with an opening and closing movement. Even though that polycomponential sign was produced with only one hand, the same sign would likely not have been possible while also articulating the PS1: [4 handshape] of his first-production clip since that would have been motorically very difficult. In fact, it would likely have violated Battison's (1978) symmetry constraint for two-handed signs. Rather than produce the differing handshapes and movements, DH5 seems to have dropped the production of PS1: [4 handshape] altogether for the second-production clip because of the motoric constraint. Instead, DH5 portrayed the flowing water (and simultaneous drinking) by articulating the PS1: [1 handshape] found in section e of table 1.

Elicitation Clip E: Lizard Walking Away

DESCRIPTION. A large gray lizard with spots, shown at a close-up angle taken from the ground, is walking away from the camera. The

lizard has thick legs and a thick tail that moves slowly back and forth. The lizard's eyes are bulging out from either side of its head and are moving around in their sockets. From the top of the head to the tail, the lizard has a row of fleshy spikes similar to those of a crocodile. The lizard's stomach is large and round, and it sways slightly from side to side as the lizard ambles away from the camera. The lizard continues walking for more than ten seconds, and, at the end of the clip, it stops walking and raises its head slightly above the rest of its body.

Here is a partial list of the meaningful aspects of this elicitation clip:

There is the physical context for the action/movement.

- a. A lizard is facing away from the viewer at eye level.
- b. The lizard is gray with spots and has thick legs and a thick tail, eyes bulging out of the sides of its head, spikes running down its spine, and a large round stomach.
- c. The lizard ambles away from the viewer (more than ten seconds).
- d. The lizard's torso moves from side to side while walking.
- e. The lizard's tail wags slowly while walking.
- f. The lizard's eyes move within their sockets.
- g. The lizard raises its head above its body.

There are at least three examples of polycomponential signs alone resulting in a lack of articulator-referent correspondence that can be described for the data from the lizard walking away clip. Two of those (section d of table 2) correspond with the conventionalization of polycomponential signs. The third is an example of an insufficient number and type of articulators to create an optimal correspondence with various parts of the referent.

In DD2's second-production clip to portray the lizard ambulating away from the viewer/camera, he utilized the PSI: [X hs, 2h] to depict the lizard's legs. However, a crucial piece of information about that creature's action is missing from these polycomponential signs: the movement of the lizard's torso from side to side. The conventionalization of the X handshape to depict, among other things, only the legs of a person or an animal and not any information about the referent from the legs upward is the problem. In this case, the PSI: [X hs, 2h] cannot portray the side-to-side torso movement, thus leaving the rendition with

TABLE 2. Elicitation Clip E: Lizard Walking Away

	DD2 ⁹ 1st clarity $x = 4.47^{**}$ SD = 0.69 correctness $x = 4.26^{**}$ SD = 0.93 viewed: 1st	DD2 2nd clarity $x = 3.78^{**}$ SD = 1.22 correctness $x = 3.68^{**}$ SD = 1.20	DH2 1st clarity $x = 2.89^{**}$ SD = 1.19 correctness $x = 2.47^{**}$ SD = 1.21 viewed: 2nd	DH2 2nd clarity $x = 2.10^{**}$ SD = 0.99 correctness $x = 1.63^{**}$ SD = 1.01
a. context	SEE HEAD		ANIMAL	
b. orientation and eye level	PS3: [C hs, 2h] (tracing body) at upper torso; (signer gazes forward at PSs as if at same level)	PS1: [X hs, 2h] (legs); (signer gazes downward at PSs as if looking from above)	PS1: [P hs, 2h] (2 legs on either side facing away)	PS1: [P hs, 2h] (2 legs on either side, facing away); PS1: [S hs] (head facing forward)
c. description	a sequence of various poly-componential signs to depict the spikes and the eyes	another sequence to depict leg positions, snout, eyes, spikes, and tail (note: spikes smaller scale than first clip),	shape: PS3: [B hs, 2h] (tracing shape of stomach); leg positions: PS2: [P hs, 2h]; line of spikes PS3: [Q hs]	
d. slow walk	PS1: [X hs, 2h] (legs) then PS1: [B hs, 2h] (feet) CA: arms like front legs of lizard CA: torso moves slowly forward and from side to side	PS1: [X hs, 2h] (legs); smaller scale than first clip (i.e., the two hands are not as far apart from each other)	PS1: [P hs, 2h] (legs); CA: head hunched downward, arms in tight, slow torso movement forward	PS1: [P hs, lh] (leg) moving forward slowly [finger wiggle]; PS1: [S hs, rh] (head) moving away in unison with leg
e. stomach movement				
f. tail wagging		PS1: [X hs] (tail) stationary		
g. eye movements	PS1: [F hs, 2h] (eyes) moving around in sockets; CA: gaze downward and forward	CA: forward gaze when signer hunches head downward	CA: eyes gaze forward at end	signer gazes at hands or at investigator
h. head movement	CA: head hunched downward while walking	PS1: [S hs] (head) move side to side; CA: head hunched downward at end	CA: head/torso move downward emphatically at the end	

little manner information about that aspect of the lizard's action. On the other hand, a simultaneous constructed action (the signer's torso representing the side-to-side movement of the lizard's torso) as a complement to the polycomponential signs to represent either the lizard's legs or feet appears to be optimal—as the judgment scores in DD2's first-production clip show.

Another example of the lack of articulator-referent correspondence occurs in DH2's second-production clip, which is similar to that of DD2. In DH2's rendition, the signer uses two polycomponential signs—one articulated with each hand—to represent a leg and the head of the lizard in the sequence that portrays the lizard's slow walk. As with the example given earlier for DD2, neither of the polycomponential signs used in the second-production clip in section d of table 2 gives information about the lizard's torso movement, perhaps because it would be difficult to represent this with these polycomponential signs. In her first-production clip, DH2 included examples of constructed action (her head hunched downward, her arms pulled in tight toward her torso, and a slow movement of her torso in a forward direction)—even though those examples did not seem to fully match the lizard's movement. Thus, DH2's first-production clip contained information about the lizard's torso movement and posture while walking forward slowly (via constructed action), whereas her second-production clip did not contain that information because it could not be produced simultaneously with the two polycomponential signs that she chose to articulate for that segment.

Finally, there is one potential example of not having enough articulators for optimal correspondence between the signer and the referent. For the “slow walk” data in section d of table 2, one might argue that DH2's message was hindered by not having enough articulators (i.e., hands) to represent the two front legs of the lizard (as in the first-production clip for both signers) and the head of the lizard since the head was not represented using constructed action.

Elicitation Clip F: Snake Uncoiling

DESCRIPTION. A gray-colored snake with dark stripes is coiled up on the ground. It moves its head upward and downward and in a circular fashion as it uncoils and then returns to a coiled shape. The snake

flicks its tongue as its head moves around, and it occasionally opens and closes its mouth. During one of the circular turns of its head, the snake's moving body pinches a nearby twig, which is moved from one location to another.

Here is a partial list of the meaningful aspects of this elicitation clip:

- a. A lexical reference introduces or refers to the animal.
- b. The snake is coiled up on the ground.
- c. The snake moves its head up and down.
- d. The snake moves its head in a circle.
- e. The snake points its mouth straight upward.
- f. The snake's eyegaze follows the orientation of the face.
- g. The snake's body uncoils and coils (in a different movement from that of the head).
- h. The snake flicks its tongue.
- i. The snake opens its mouth widely and then closes it.
- j. A twig is moved by the snake's moving body.

The snake uncoiling elicitation clip reveals examples of the lack of articulator-referent correspondence of polycomponential signs—those based on the conventionalization of polycomponential signs and those based on motoric constraints. The first is based on the conventionalization of an entity polycomponential sign. The PSI: [bent B handshape opening up] is a common entity polycomponential sign used to represent a mouth opening and closing. In fact, it is used not only by sign language users but also by nonsigners, who employ it to refer to someone talking or some variation of that action.

This polycomponential sign, as used in the second-production clip in section i of table 3 by DD2, unfortunately does not provide information about other facial features of the referent. For instance, information about facial expression, eyegaze, and so on is not communicated. Interestingly, the snake itself does not exhibit facial features that resemble those of a human (e.g., affective expression, clear differences in eyegaze), but the signer nevertheless depicts those in the first-production clip with the concomitant constructed action of the signer's facial expressions and mouth movements.¹¹ As mentioned earlier, the conventionalization of the PSI: [1 handshape] as a sign that does not include information about

TABLE 3. Elicitation Clip F: Snake Uncoiling

	DD2 ¹⁰ 1st	DD2 2nd	DH5 1st	DH5 2nd
	clarity	clarity	clarity	clarity
	$x = 4.10^*$	$x = 3.42^*$	$x = 4.63^{**}$	$x = 3.73^{**}$
	SD = 0.87	SD = 1.38	SD = 0.49	SD = 0.80
	correctness	correctness	correctness	correctness
	$x = 4.26^{**}$	$x = 3.00^{**}$	$x = 4.57^{**}$	$x = 3.36^{**}$
	SD = 0.87	SD = 1.41	SD = 0.50	SD = 1.49
	viewed: 2nd		viewed: 1st	
a. lexical reference	SNAKE		BODY	SNAKE R-A-T-T-L-E
b. coiled snake on ground	LOOK (eyegaze down) PS3: [C hs, 2h] (showing compressed coil) NMS: cheeks puffed PS3: [C hs, lh] PS3: [G hs, rh] (tracing shape of coil)	(eyegaze down) PS3: [C hs, 2h] (showing compressed coil) NMS: cheeks puffed PS3: [C hs, lh] PS3: [G hs, rh] (tracing shape of coil)		PS1: [bent U hs] (head) PS3: [1 hs tracing layout]
c. up-down head movement	PS1: [bent B hs] (head) CA: backward head tilt	PS1: [bent B hs] (head) CA: backward head tilt		
d. circular head movement	PS1: [bent B hs, turning to right and left], (head turning) CA: head tilt to right	PS1: [bent B hs, turning to right and left] (head turning) CA: head tilt to right	PS1: [flat O hs] (snake's head), [bent V hs] (snake's fangs) CA: head moving around; backward head tilt	PS1: [flat O hs] (snake's head)
e. mouth points straight upward	PS1: [bent B hs, palm upward] (head pointing upward) CA: backward head tilt	PS1: [bent B, palm upward], (head pointing upward) CA: backward head tilt		
f. eyegaze follows head/looks around	not entirely clear, although seems to look at PSs except for (e) and (i) segments	not entirely clear, although seems to look at PSs throughout	yes	seems to look at PSs

TABLE 3. (Continued)

	DD2 ¹⁰ 1st clarity $x = 4.10^*$ SD = 0.87 correctness $x = 4.26^{**}$ SD = 0.87 viewed: 2nd	DD2 2nd clarity $x = 3.42^*$ SD = 1.38 correctness $x = 3.00^{**}$ SD = 1.41	DH5 1st clarity $x = 4.63^{**}$ SD = 0.49 correctness $x = 4.57^{**}$ SD = 0.50 viewed: 1st	DH5 2nd clarity $x = 3.73^{**}$ SD = 0.80 correctness $x = 3.36^{**}$ SD = 1.49
g. body movement as different from head movement	CA: some backward torso shift	CA: very minimal torso shift	CA: emphatic body shift	
h. tongue flicking			PS1: [S hs to V hs, at least five repetitions]	PS1: [flat O hs to flat O with extended middle finger]
i. mouth opens and closes	PS1: [bent B hs, opening up] CA: mouth opens and closes	PS1: [bent B hs, opening up]		PS1: flat O hs to C hs
j. twig movement	PS1: [G hs, lh] PS1: [bent B hs, rh] (snake's head) CA: head jerk backward			

facial details possibly encourages a signer to adopt constructed action, in many cases, to complement the sign, even when an animate referent may not actually exhibit the facial expressions the signer articulates.

Both participants were also limited by motoric constraints of polycomponential signs in the snake uncoiling data, and the limitations most likely resulted in inadequate articulator-referent correspondence. This point is illustrated by focusing on the accordion action of the snake's body apart from the head movement (section g of table 3).

In the case of DH5, his dominant hand articulated one of several polycomponential signs (PS1: [S hs], PS1: [bent U hs], PS1: [flat O hs]) that depicted all or part of the snake's head. However, in order to show the actual movement of the snake's body with the signer's arm, the human arm would have to contain several joints between the elbow and the wrist—a scenario that is not the case in our current evolutionary state. Thus, the inability of the arm to move as the snake's body moved

(a motor constraint) in the elicitation clip places a limit on the information that can be communicated with the sole use of the polycomponential sign. Whereas the human torso cannot mimic the snake's flexibility, it can show some wiggling movement. In the case of DH5, an emphatic body shift (section g of table 3) indicated some body movement of the snake that was separate from that of its head. Constructed action portrayed this movement because the polycomponential signs could not do so due to limitations on how the arm can move between the elbow and wrist joints.

For DD2, the nondominant hand was holding the dominant arm near the wrist, which indicates that the arm should probably not be considered as part of the snake's body, as may have been the case with DH5's rendition. So, DD2's articulation (the nondominant hand holding the wrist of the dominant arm) eliminated the motoric constraint of a lack of joints between the wrist and elbow by having the signer and viewer consider only the hand as the articulator to correspond with the same body part of the snake (the head). Like DH5, DD2 also moved his torso (section g of table 3) in a type of constructed action that showed what the snake's body was doing. While there was some torso movement in both production clips, the displacement from DD2's first-production clip was much more obvious. Likewise, rather than use a separate polycomponential sign to portray the snake's body movement, DH5 moved his torso simultaneously with the articulation of the "head" polycomponential sign in the first-production clip—a use of constructed action for the portrayal of the snake's body movement apart from the head movement.

Elicitation Clip G: Woman Performing a Cartwheel

DESCRIPTION. A young lady is in the hallway of an office building, and the camera view is mostly from her front side. She raises her arms into the air, spins around on one leg, and then drops her arms back down. She then raises her arms once again and looks downward as if preparing to perform a cartwheel. She performs a single cartwheel, lands on her feet, and then turns to look at the camera with a smile. In the last frame her arms are still raised (about the height of her upper torso), and the camera is focused on the side of her body rather than the front.

Here is a partial list of the meaningful aspects of this clip:

- a. A physical context for action/movement is established.
- b. There is a frontal view of a woman in a hallway (camera angle).
- c. The woman raises her arms into the air.
- d. The woman spins around on one leg.
- e. The woman drops her arms back down.
- f. The woman raises her arms to prepare for the cartwheel.
- g. The woman performs a cartwheel.
- h. The woman lands on her feet.
- i. The woman's arms remain elevated.
- j. The woman is gazing at the camera.
- k. The woman has a smile on her face.

In the woman performing a cartwheel data, the limitations on the use of polycomponential signs seem to lie with the fact that such signs do not contain information about facial features, torso movement, and arm movement. Commonly used conventionalized forms (e.g., PS1: [1 hs] or PS1: [V hs]) that represent a person can be viewed as factors that lead to inadequate articulator-referent correspondence because valuable information about the animate referent is missing.

In segments c, e, f, and i of table 3, one or both of the participants (DH2 and DH4) use constructed action for portraying arm movement, torso position, and arm position for the first-production clips. If we focus on the woman's arms, information about how they are configured and how they move is absent from each signer's second-production clips—likely because the entity polycomponential sign that they used to represent the woman tumbling through the air was a PS1: [V handshape], which cannot represent information about the agent's arms. In fact, trying to add other polycomponential signs with the other hand to the PS1: [V handshape] seems very difficult from an articulatory point of view, which may have contributed to the manner in which such conventionalized forms have evolved over time.

Other valuable information such as hand movements, facial expression, and torso configuration are also not present with the sole use of polycomponential signs. Rather, the signer's first-production clips with constructed action portrayed more of the woman's characteristics

TABLE 4. Elicitation Clip G: Woman Performing a Cartwheel

	DH2 1st clarity $x = 4.00^{**}$ SD = 0.94 correctness $x = 3.84^{**}$ SD = 0.89 viewed: 2nd	DH2 2nd clarity $x = 2.42^{**}$ SD = 1.07 correctness $x = 2.26^{**}$ SD = 1.04	DH4 1st clarity $x = 4.52^*$ SD = 0.51 correctness $x = 4.52^*$ SD = 0.61 viewed: 1st	DH4 2nd clarity $x = 4.10^*$ SD = 0.73 correctness $x = 3.73^*$ SD = 0.87
a. context	GIRL		NICE GIRL FOOL-AROUND	NICE GIRL
b. camera angle				
c. hands/ arms raised	CA: arms raised; head back, eyes closed			
d. spin around	SPIN-AROUND	PS1: [G hs, turn-around]	SPIN-AROUND FINISH	SPIN-AROUND
e. hands down	CA: hands down (partially)			
f. hands/ arms raised	CA: hands/arms raised above head		CA: hands/arms raised, then cart- wheel movements	
g. cartwheel	PS1: [V hs, rh] (showing cartwheel) PS1: [B hs, lh] (showing floor)	PS1: [V hs, rh] (showing cart- wheel) (note: no lh PS to show floor)	PS1: [V hs] (showing cartwheel)	PS1: [V hs, rh] (showing cartwheel) PS1: [B hs, lh] (showing floor)
h. lands on feet				contact of PS V hs on B hs
i. arms remain elevated	CA: arms raised		CA: arms raised	
j. gazes at camera	gazes at investigator	gazes at investigator	gazes forward	
k. smiles	CA: big smile		CA: big smile	

as shown in the elicitation clip. Thus, several of the segments in this example demonstrate that the use of polycomponential signs alone can in some cases lead to a lack of articulator–referent correspondence, which then encourages the use of constructed action.

Data Presentation: Quantitative

This section briefly touches upon a few notable trends evident in the data in figure 1. First, the clarity parameter usually scored higher than the correctness parameter. Second, of the eight first-production clips, five (i.e., a majority) scored on average at least 4 in both clarity and correctness. However, of the eight second-production clips, only two (i.e., a clear minority) had an average score of 4 or better, and that was for clarity.

As mentioned earlier, clarity was consistently judged higher than correctness, and one may wonder why this is so. Two possible reasons are offered here. Humans can make sense out of various types of language input—grammatical or ungrammatical—even though the input may not be the “proper” or “correct” way to say something. Anyone who has ever conversed with a second-language learner, especially a beginner who shows only nascent skills in a language, knows that it is sometimes difficult to understand what the person is trying to say. But in many cases the interlocutor (e.g., a fluent user of that language) comprehends the intended message despite ungrammatical or less-than-robust input. The same may have been true in the case of the production clips in the study. However, one other possible account for the higher clarity ratings is that the judges had recently viewed the stimuli clips that were used for language elicitation, and they were not trying to obtain an understanding of the object in the description based solely on the signed renditions.

The differences between the first- and second-production clips with regard to average scores is also worth noting. For the first-production clips, which normally contained examples of constructed action that were absent from the second-production clips, both clarity and correctness were consistently judged to be at least a 4, which is on the high end of the scale. This was the case regardless of the viewing order of the clips (i.e., whether the judges viewed the first-production clip before or after the second-production clip). However, for second-production

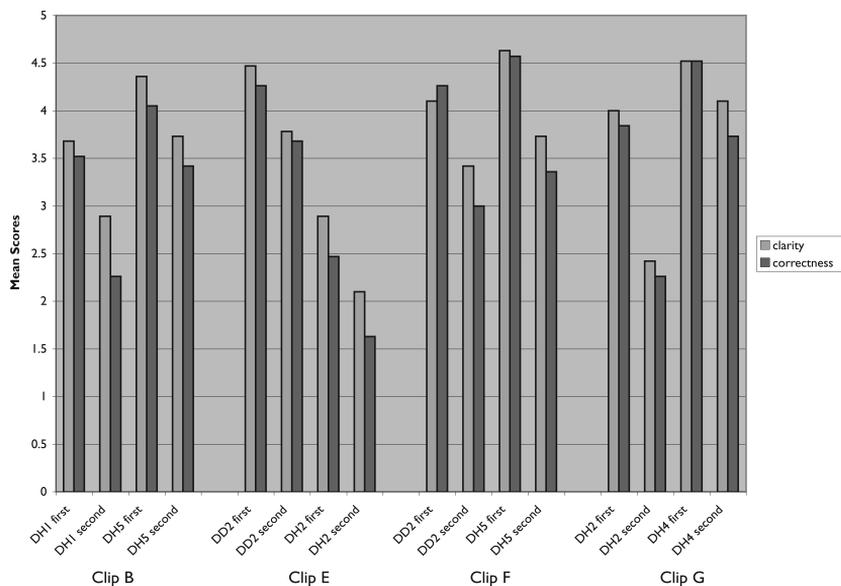


FIGURE 1. Ratings for clarity and correctness.

clips, which often contained polycomponential sign renditions of at least part of what had been communicated in the first-production clips, only two of the eight clips were judged to be at least a 4, and those two were only for clarity.

General Discussion

The data presented here in the form of production clip pairs whose individual clips were judged to be significantly different from each other in both clarity and correctness provide preliminary evidence for ways in which polycomponential signs alone sometimes do not produce adequate information about a referent.¹² I contend that an inadequate correspondence between a signer's arms and hands and an animate referent results when a signer avoids the use of constructed action because the natural tendency is to use the body to support the communication of information that the signer deems necessary.

Regarding the data that were described qualitatively earlier, the lack of correspondence between articulator and referent was caused by

the following: the inability of entity polycomponential signs to provide specific information about salient aspects of an animate entity, limitations on information based on the number and shape of articulators, and motoric constraints imposed by human articulators and limitations on human movement. Examples of each of these are summarized here.

The conventionalization of a polycomponential sign limits the information about a referent that the sign can communicate. For instance, the PS₁: [O handshape] as a representation of a woman's mouth while drinking water does not provide information about her mouth configuration while drinking nor does it provide much detail about her torso position. The PS₁: [X handshape, 2h] used for the front limbs of a lizard also do not provide information about torso movement, head hunch, or even the location of the lizard's legs in relation to its torso (i.e., close to the torso or partially extended, as with a wider stance). Additionally, the PS₁: [bent B handshape opening up] to represent the snake's mouth opening up does not reveal anything about eyegaze or facial expression (e.g., mood or intent). As mentioned earlier, the PS₁: [1 handshape] to represent a woman about to perform a tumbling move does not provide details about facial features or body movements of the torso, arms, or hands. This is also true for the PS₁: [V handshape], which was used for the same clip to depict a standing person. All of the types of information that these polycomponential signs failed to impart were indeed provided in the first-production clips via constructed action.

Polycomponential signs alone may also not allow for optimal correspondence with important aspects of an animate entity as a function of the number and shape of the articulators that humans have to represent the parts of an animate entity and to describe how it interacts with its surroundings. One example of articulator shape is the PS₃: [O handshape] that was used to represent a human's mouth (woman at water fountain clip). The shape that the hand makes when articulating this polycomponential sign is presumed to correspond to the shape of the woman's mouth, with the index finger and thumb representing the upper and lower lips respectively. This polycomponential sign, while presumably referring to the woman's lips, does not correspond well with the woman's closed mouth. Keep in mind that the use of this polycomponential sign is somewhat improvised as the

participant was asked to avoid using the pursed lips of constructed action. In this case, there may not have been a better choice for a polycomponential sign that would have corresponded more accurately to the woman's pursed lips.

Not having enough articulators to represent parts of the referent's body was evident in the data as well. In the woman at the water fountain clip, one signer could not simultaneously represent the drinking action, the engagement of the water release handle, and the stream of water by articulating only polycomponential signs. However, this *was* possible with the simultaneous use of constructed action and polycomponential signs. Further, both participants whose data are shown for the lizard walking away clip provided evidence that a signer cannot present simultaneous information about a lizard's two front limbs and head while refraining from using constructed action. In all of these cases, the use of constructed action supported the correspondence between the signer's body, arms, and hands and the referent.

Finally, at least two examples of polycomponential sign use revealed motoric constraints that possibly explain why the use of constructed action provided a clearer correspondence between the referent and the signer. The first example involves the woman at the water fountain clip and the way in which one signer could not simultaneously depict, via polycomponential signs alone, the sucking action of the woman's mouth while also showing the flowing water. The second example involves the snake uncoiling clip and illustrates how the arm, which represented the snake's body, could not show its accordion-like action. The human torso is not equipped to exactly mirror the action of the snake, but it can move in ways that allow the signer to provide a richer correspondence between the referent and the signer's body. As in the other examples, constructed action portrayed aspects of the referent that the polycomponential signs could not (because of motoric constraints), thus allowing for a stronger correspondence between the signer and the referent.

Constructed action, then, seems to allow for more informatively rich simultaneous communication about an animate referent because of a more robust correspondence between the referent and the signer created by either constructed action and polycomponential signs together or constructed action alone. Essentially, constructed action allows the

signer to simultaneously depict important aspects of the animate entity such as facial affect or expression, torso position and movement, hand and arm movement, eyegaze, mouth configuration, and possibly other aspects of an entity as well. The qualitative and quantitative data in this article suggest, among other things, that constructed action is obligatory, at least in part, because polycomponential signs cannot always provide all of the desired information about a referent.

One of the common characteristics of the elicitation clips is that they each included animate entities—humans or animals—that interacted in various ways with their environments. The communication of an object's animacy, either perceived or real, seems to be intimately tied to the use of constructed action. As a result, constructed action would likely not be used when polycomponential signs are describing inanimate entities (such as the lexicalized polycomponential signs in the ASL sign SUNSET [shown in Chuck Baird's *Sunset in Austin* in figure 2]). In such cases, the hands and arms (primarily as polycomponential and other signs) and constraints of the linguistic system (e.g., phonology, morphology, syntax) must guide the creation of meaning.

However, constructed action would likely be preferred with descriptions of animate entities. Of course, there are exceptions, such as the poetic use of signed language when anthropomorphizing inanimate entities. I do not contend that constructed action is, on its own, a better or more useful communicative device than polycomponential signs, other signs, and grammar. Rather, constructed action is a necessary part of signed language because it complements other communicative mechanisms.

As noted in Quinto-Pozos (2007), the results reveal that the use of polycomponential signs and constructed action is interconnected. In some cases, a signer will use both simultaneously to communicate various types of information about a referent but at other times use one or the other alone. As mentioned earlier in this article, oftentimes polycomponential signs are used in isolation (i.e., without constructed action) when a signer wishes to communicate information about the entity's path movement or even location in relation to other objects or when the signer neither wants nor needs to communicate other information, such as upper-body movements, facial expression, or direction of eyegaze.

At times, the simultaneous use of polycomponential signs and constructed action provides the signer with a way to portray an entity at different scales, and sometimes the information communicated by polycomponential signs and constructed action is different. For instance, a simultaneous PSI: [1 handshape] that is moving forward in a zigzag fashion, along with a dizzy look on the signer's face, communicates complementary information. One example of this appears in section c of table 2, a row of information that depicts the ambling away of a lizard. In that clip, the use of PSI: [P handshape, 2h] depicts the lizard's legs, which are moving forward while the signer's own head is hunched downward, her arms are pulled in tight toward her torso, and her torso moves forward slowly. The PSI: [P handshape, 2h] to depict the lizard's legs is certainly smaller than the signer's own head, arms, and torso, which depict the lizard's body.

However, sometimes information that is portrayed by polycomponential signs and simultaneous constructed action appears to be at similar scales. One example in the data is the use of PSI: [F handshape, 2h] to depict the lizard's eye movements by DD2 while the signer simultaneously gazes downward and forward. In this case, the two mechanisms are at approximately the same scale, but the information is complementary.

Other authors have also described various interactions between polycomponential signs and constructed action. Aarons and Morgan (2003) describe similar patterns in South African Sign Language. Moreover, differences in scale or size between polycomponential signs and constructed action have been described in various ways. Dudis (2004) maintains that a scalar property of real-space blends allows size or scale differences to reflect either participant viewpoints or global viewpoints. Other researchers (Schick 1990; Janzen 2004) have described such differences as shifts in perspective that allow a signer to describe a situation and to utilize the perspective as a part of the verbal construction. Perniss (2007) reports that, in German Sign Language, a signer can use the entire upper body in conjunction with polycomponential signs to simultaneously articulate information that describes an event from different perspectives.

The relative scale that is implicated with the production of a polycomponential sign may have an effect on any ensuing lack of articula-

tor-referent correspondence. Polycomponential signs that describe small and detailed aspects of animate entities may not provide sufficient information about certain other aspects of the animate entities they represent; thus constructed action will likely be used in those cases to portray human and animal body movements and expressions of affectual (i.e., emotional) information.

As mentioned earlier, appropriate choices of both polycomponential signs (and the scale they communicate) and constructed action also have to do with what the signer believes is important to communicate about a specific object. As Taub (2001) suggests with the creation of iconic elements in signed languages, an important step in the process of representing something in sign language is to modify or “schematize” it so that the significant features are representable. Whether a polycomponential form is being created over an extended period of time (as with the conventionalized iconic forms that Taub refers to in great part) or in an impromptu fashion (as with some of the iconic forms that were created by the signers in this study, such as DH5’s depiction of the snake’s flicking tongue with an extended middle finger, as shown in table 3, row h), only certain aspects of a referent (or a “concept,” as Taub says in the Image Selection step of her model) can be coded in the language. The criteria that a signer uses to determine important details is a matter left to future research in this area. Moreover, much work remains to be done in the area of differences of scale between polycomponential signs and constructed action.

Factors That May Be Fueling the Necessity for and Sustainability of Constructed Action

The claims made in this article should also be considered within the larger question of what factors encourage ASL and other sign languages to rely on constructed action for communicating important information about animate entities. In other words, why do signers look for a correspondence between parts of their bodies and parts of referents? Several points may provide clues to the answers. The first and perhaps the most obvious response concerns the human desire to represent something that an animate entity does with the use of one’s own body. Second, the simultaneous nature of signed languages allows for the robust use of constructed action. Third, constructed action may lead to

fewer lexical items in sign languages that describe parts of animate entities and their actions.

The Human Desire to Use Constructed Action for Representing the Characteristics and Actions of Animate Entities

The body actions that make up constructed action have been reported for various sign languages other than ASL, such as South African Sign Language (Aarons and Morgan 2003), British Sign Language (Sutton-Spence and Woll 1999), Danish Sign Language (Engberg-Pedersen 1992), and German Sign Language (Perniss, 2007). Not all writers have referred to such body actions as constructed action, but their descriptions appear to align with what I have described here. Some authors feel that the body actions that make up constructed action may be the easiest way to communicate information about animate entities. For example, Taub (2001, 77) suggests that “[s]ometimes it is easier to produce and recognize body movements associated with an object than an analogue of the object itself.” Taub also feels that most prototypical animals have the same body type as humans, which is why we see frequent correspondences between signer and animal.

Further, several authors have reported the use of constructed actionlike renditions by users of spoken language. Clark and Gerrig (1990) have proposed a theory that quotations in spoken language are actually *demonstrations* by speakers. In demonstrations, speakers use their body and voice to portray various aspects of someone or something to which they are referring. Clark and Gerrig and other authors (e.g., Goldin-Meadow and McNeill 1999) suggest that many things are easier to demonstrate (i.e., via constructed action) than to describe, such as the action of tying a necktie or shoe laces or illustrating the shape of a coastline, but they do not suggest that it is absolutely necessary to employ a demonstration rather than utilize a spoken description. Liddell (2003) also suggests that users of spoken language take advantage of constructed action at various times. We also know that users of spoken language gesture as they speak, and those gestures can depict shifts in perspective (McNeill 1992).

McNeill (*ibid.*) also describes *iconics*, or a type of gesture that speakers use when showing the actions of another person. The author’s descriptions of iconics demonstrate that such gestures can resemble the

constructed action described here and in other works. Additionally, McNeill (1999, as cited in Taub and Galvan 2001) found that Spanish speakers, when describing motion events that contain no manner information in the speech signal, frequently move their hands in ways that depict someone's manner of movement, such as climbing, walking, or falling. In all of these cases, constructed action is described as an efficient and robust method of communicating certain information about animate entities (and other objects as well) and their actions or movements, although constructed action may not be the most efficient (or even the most appropriate) way to communicate information about path, manner, and even orientation of some objects. In an example of English discourse from a movie, MacGregor (2004) shows how real-space blends (a term used to describe constructed action within a theory of mental spaces) is also robust.

Simultaneity in Signing

The simultaneous nature of signed communication may also be a key factor in the apparent necessity for and sustainability of constructed action in signed language.¹³ At least two facts contribute heavily to the simultaneous nature of sign language. One is that signers have multiple articulators that can communicate several pieces of information at the same time, and the other is that the visual/gestural modality has a greater “bandwidth” than the auditory/oral modality. Regarding the latter, Meier (2002) suggests that, “at any instant in time more information is available to the eye than the ear, although in both modalities only a fraction of that information is linguistically relevant” (10). Emmorey (2002) is consistent with Meier's argument in her claim that it is easier to visually perceive spatially disparate information in parallel than to observe and decipher different types of auditory information simultaneously. In other words, it is easier to perceive complex visual displays at once than auditory signals, which may contain disparate types of information. The fact that a signer has multiple articulators that can work simultaneously and that the visual modality has a greater potential for the simultaneous communication of various types of information allows sign languages to develop and sustain complex and elaborate uses of constructed action—at times with the simultaneous use of polycomponential signs. Perniss (2007), appealing

to Gricean conversational maxims (Grice 1975), suggests that signers take advantage of the fact that the signed modality is particularly suited for the simultaneous and therefore efficient communication of various types of information.

Yet, various authors have also noted that ASL seems not to favor the simultaneous articulation of certain types of information, such as the manner of motion of an entity and its path or direction of motion (Supalla 1990; Taub and Galvan 2001). This has also been reported for a younger cohort of signers of Nicaraguan Sign Language, which is an emerging language (Senghas, Özyürek, and Kita 2003). In the case of ASL, Supalla argues, the signer must use more than one polycomponential sign (or verb of motion, to use his terminology) and articulate the signs in sequence. This generalization about the communication of path and manner information may not be true for all sign languages, however. For example, Hong (2003) reports that the sequential articulation of path and manner in Korean Sign Language does not always occur and that some signers communicate that information simultaneously—at least occasionally. The degree to which constructed action could capture information about path and/or manner of motion has not been explored, and there could be ways in which constraints on simultaneity with polycomponential signs (e.g., simultaneous production of path and manner of motion) in ASL could influence constructed action production as well. What seems evident, though, is that constructed action, in simultaneous combination with polycomponential signs, can provide rich information about animate entities.

Smaller Subsets of Sign Vocabularies That Deal with Animate Entities

In the case of information about the actions and body movements of animate entities, a signer's choice to employ constructed action for communicating various points about the object may actually influence the lexicon of the sign language to contain fewer traditional linguistic devices for communicating the same information. Essentially, the robust nature of constructed action may be a significant factor in the lack of linguistic (lexical, morphological, and syntactic) ways to describe the actions of animate entities. In other words, use of the signer's body (in the form of constructed action) has become a nec-

essary strategy that is complementary to the use of traditional linguistic devices for communicating information about animate entities.

Many people suggest that sign languages appear to have comparatively smaller vocabularies than spoken languages. For example, while English has several words to indicate intoxication from alcohol (e.g., *inebriated*, *intoxicated*, *drunk*, *sloshed*, including idiomatic phrases such as “three sheets to the wind” and “under the influence”), ASL can communicate similar differences in meaning by modifying nonmanual signals and other body movements that accompany the sign DRINK. Indeed, Stokoe (2001) advanced the claim that ASL appears to have a smaller vocabulary than English:

The first and most striking difference is vocabulary size. Sign language generally has many semantic areas covered by a single sign, whereas the same or similar areas of meaning are covered by a number of different words in English. Everyone who first begins to study the communication of persons using sign language notes with surprise the subtlety and precision of their interchanges. Sign language has no need for large numbers of closely related separate items of vocabulary, because one sign can be easily modified to express many degrees of meaning. Sincerity, intensity, interest, and other nuances are part of the signer's performance of a sign. (402)

In other early writings on ASL, Klima and Bellugi (1979, 379) also reported that constructed action (although the authors referred to it as depiction or mime) is a device that Deaf signers use when a specifically nuanced sign does not exist in the vocabulary: “Deaf informants tell us that they use mime and depiction to make a story more colorful, to describe something precisely, to convey precise nuance or feeling, to imitate more directly, as well as in cases where there is no conventionalized sign. . . . Of course, it is also true that ASL (and presumably other sign languages as well) utilizes other strategies for communicating information about specific concepts or items that do not have lexical signs to represent them.”¹⁴

Yet, one of the factors that may have an effect on the growth of a portion of the ASL vocabulary (and presumably other sign languages) is the use of polycomponential signs and constructed action.¹⁵ In other words, the robustness of constructed action regulates the growth of

part of the vocabulary of a sign language since the same (or even, perhaps, more precise) meaning can be communicated with constructed action or polycomponential signs rather than with lexical signs. This aligns with the claim made by Goldin-Meadow and McNeill (1999, 164) about how “mimetic encoding fills in where categorization reaches its limit.” Taub, Piñar, and Galvan (retrieved March 12, 2006) also claim that spoken languages like English and Spanish convey more information by using lexical devices while ASL takes advantage of gestural means. In the end, there may be very similar amounts of information conveyed via the different languages—the main difference is the devices that are employed to convey that information. Thus, ASL may have evolved to not capture all of the salient parts of a message about animate entities with signs and traditional grammar since constructed action, along with polycomponential signs, allows for efficient communication about such objects.

Further Questions about Constructed Action

As one can imagine, a great deal remains to be learned about constructed action and its role in signed language use. For example, the interaction between constructed action and more traditional linguistic devices (including syntactic aspects of grammar) needs to be investigated. Additionally, questions about language acquisition and how the learning of constructed action affects the development (e.g., cognitive, psychological, literate, artistic, etc.) of children (and adults) who use the language should be addressed. Finally, it may be the case that constructed action can be used as a tool for individuals who have a language impairment—especially if constructed action is a communicative device that can be employed even though a person may have damage to the language-production areas of the brain. These are all questions that should be addressed empirically.

Conclusion

This article has discussed factors that seem to influence a signer’s choice of polycomponential signs or upper-body movements (i.e., constructed action) or both simultaneously. The iconic nature of signed languages appears to strongly encourage signers to produce segments that create

one-to-one correspondences between parts of their bodies (either hands and arms or entire portions of the upper body) and the referents. This is particularly true with animate entities, and signers take advantage of parts of their own bodies to depict various aspects of the referent. This depiction appears not to be haphazard. Rather, it could result, in part, from limitations (of various types) that classifiers (i.e., polycomponential signs) and other signs place on clear and robust communication about an animate referent.

Notes

1. In 2002 Baird modified this painting by adding sections of wood to represent the arms signing the sunset. For this reason, this work is signed twice—once in 1978 and again in 2002. I want to thank the artist for allowing the use of his work in this article.

2. I adopt the term “polycomponential signs,” following Slobin and colleagues (2003) and Schembri (2003) to refer to the linguistic devices that have previously been referred to as classifiers, classifier predicates, classifier constructions, and so forth. Some analyses (e.g., Schembri 2003) suggest that such constructions are not entirely like classifier constructions in spoken languages.

3. Whereas it is common for the upper body to be involved in the communication of information about characters in a narrative, some styles or registers of ASL may elicit lower body movements as well (Quinto-Pozos and Mehta, in review).

4. The transcription system is explained at the end of table 1.

5. The first row of each table contains the following abbreviated information: DH = Deaf of Hearing, DD = Deaf of Deaf, \bar{x} = mean, SD = standard deviation, $** = p < .01$, $* = p < .05$, and whether the first clip was viewed (in random order) first or second by the judges.

6. It is often difficult to determine whether a hand configuration should be considered a handle polycomponential sign (PS₂) or an instance of constructed action. The analysis of such forms is beyond the scope of this article, and a determination of the status (as either a PS form or CA) does not affect the fundamental arguments I make about constructed action. For this article I label such forms as handle polycomponential signs (following previous similar labeling), but the question remains of whether that is the appropriate designation.

7. Even though the elicitation clip indicated that the water release mechanism was a bar to be pushed, several of the Part A participants depicted the action as the turning of a knob, which is a common way to release water from water fountains in the United States.

8. Some authors (e.g., Taub 2001) refer to this as an “element” classifier.

9. See <http://gupress.gallaudet.edu/SLS/SLS7-4lizards.html> for the two film clips of DD2 depicting the lizard walking away.

10. See <http://gupress.gallaudet.edu/SLS/SLS7-4snakes.html> for the two film clips of DD2 depicting the snake uncoiling.

11. If one considers the sign form that is described here as a lexical sign (e.g., OPEN-MOUTH, YAWN) in order to label the mouth opening as a lexical nonmanual signal rather than constructed action, an explanation would have to account for how that lexical sign seamlessly tied in with the polycomponential signs that preceded and followed it. No clear articulatory difference is signaled between the polycomponential sign depicting the snake’s mouth and any lexical sign that would represent the opening of the mouth. Thus, the entire sequence is considered a single polycomponential sign for this analysis, and no simple—and perhaps obligatory—lexical nonmanual signal (e.g., [open mouth]) would need to be posited.

12. The judged differences between the first- and second-production clips may not have been caused solely by differences in the use of constructed action. Admittedly, other factors not analyzed here may also have influenced the signer’s renditions, which, in turn, caused the first-production clips to be more robust in clarity and correctness. However, the constructed action seems to be one of the most obvious differences in the clip pairs. In order for the reader to evaluate this claim, I have included as much data as possible in the tables.

13. Recent writings (e.g., Aronoff, Meir, and Sandler 2005) suggest that the relative scarcity of sequential structure in sign languages can be attributed, at least in part, to the youth of the sign languages that have been studied; the hypothesis is that sign language structure becomes more sequential as the languages mature. What this claim means for the use of constructed action and how it interacts with the grammar of signed languages is a question for future work on this topic.

14. For instance, ASL has specific mechanisms for communicating information about sub- and superordinate category items if a single sign does not exist for them (Klima and Bellugi 1979). One of the strategies signers employ, especially in the case of subordinate items (e.g., a grand piano versus an upright piano or a spinet) is to use a general lexical item for a category of items (e.g., PIANO), followed by polycomponential signs to describe the specific type of item. This example is of an inanimate entity, so constructed action would not be expected.

15. Other possible reasons that sign languages have smaller vocabularies are that they are relatively young and have not yet had time to develop the extensive vocabularies of some spoken languages. Some authors (Meier 2002; Newport and Supalla 2000; Aronoff, Meir, and Sandler 2005) claim that the relative youth of sign languages can be an important factor in the ways in which they

appear to analysts today. Also, factors such as spheres of use and the lack of widely used writing systems may affect the vocabulary size of a sign language.

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Appendix



FIGURE 2. Chuck Baird's *Sunset in Austin* (ASL SUNSET/SUNRISE)

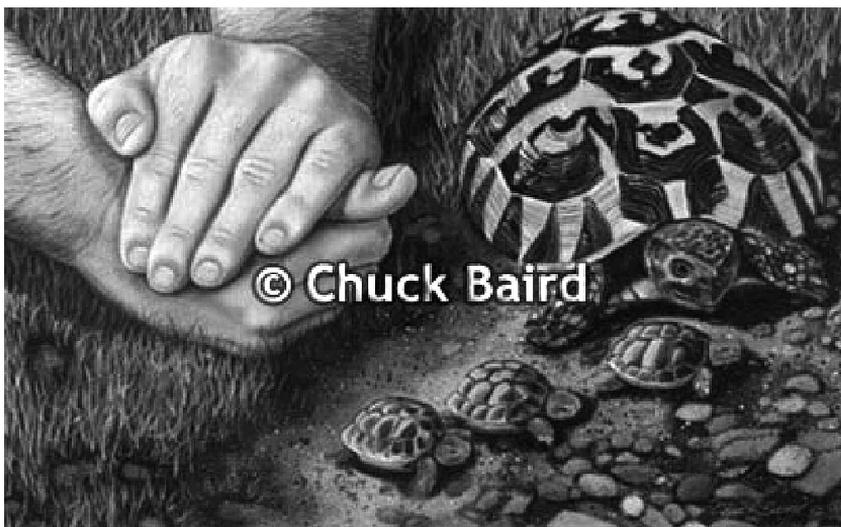


FIGURE 3. Chuck Baird's *Fingershell* (ASL TURTLE)